REMARKS

The above amendments to the specification, claims and abstract have been made to place the application in proper U.S. format and to confirm with proper grammatical and idiomatic English. None of the amendments herein are made for reasons to patentability. No new matter has been added.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "**Version with markings to show changes made**".

In the unlikely event that the transmittal letter is separated from this document and the Patent Office determines that an extension and/or other relief is required, applicant petitions for any required relief including extensions of time and authorizes the Assistant Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing docket no. 449122003100. However, the Assistant Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

Respectfully submitted,

Dated: June 28, 2001

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

For the convenience of the Examiner, the changes are shown below with deleted text in strikethrough and added text in underline.

In the Specification:

Page 1 before the first paragraph, has been amended to include the following insert:

This application claims priority to International Application No. PCT/DE99/02391 which was published in the German language on August 2, 1999.

Page 1 before the first paragraph, please delete the following:

~~Description~~

Page 1, between lines 6 and 7 has been amended to include the following heading:

TECHNICAL FIELD OF THE INVENTION

Paragraph beginning on line 7 of page 1 has been amended as follows:

The invention relates to a method for controlling a switching system, and in particular, to a method for controlling a switching system which has a central control unit and a number of peripheral terminal devices.~~, wherein~~

~~a job message is sent from one of the terminal devices to the control unit,~~

~~switching control actions are performed by the control unit in dependence upon the job message, and~~

~~in case of successful performance of those actions, a corresponding performance message is sent from the control unit to the terminal device.~~

Page 1, between lines 13 and 14 has been amended to include the following heading:

BACKGROUND OF THE INVENTION

Paragraph beginning on line 15 of page 1 has been amended as follows:

In modern switching systems of telecommunication networks, such as~~, for example,~~ the EWSX system ~~of the applicant~~, ~~there are~~ connected to the central control unit --the so-called MP (Main Processor)-- are a plurality of peripheral modules on which there is also a processor. The peripheral modules are, for example, terminal devices such as so-called SLMs (Subscriber Line Modules) or, in the case of the EWSX system, so-called LICs (Line Interface Circuits), and serve to link terminal line units and other switching systems. The central control unit coordinates the operation of the terminal devices and manages the services occurring at the exchange.

Paragraph beginning on line 8 of page 2 has been amended as follows:

In commonly used protocols for message exchange within a switching system, there is a known capability for a job dispatched by a terminal device to be canceled at the central control unit as long as the processing of the job is not yet completely finished. In the event of an error in the job processing, the old job is first called back and then started anew with a new job message. ~~But such~~ Such a callback of a job has the consequence that all actions already initiated, including those that were already brought to a successful intermediate status, have to be canceled again, which involves a considerable avoidable effort.

Page 2, between lines 15 and 16 has been amended to include the following heading:

SUMMARY OF THE INVENTION

In one embodiment of the invention, there is a method for controlling a switching system which has a central control unit and a number of peripheral terminal devices. The method includes, for example, a method for sending a job message from one of the terminal devices to the control unit, performing switching control actions by the control unit based on the job

message; and sending a corresponding performance message from the control unit to the terminal device when the switching control actions are successfully performed, wherein the terminal device, any open job message for which the associated performance message has not yet arrived after expiration of a specified wait time from the time of sending is resent to the control unit and, at the control unit, actions of the switching control based on an arrived job message are skipped if they were already processed by means of earlier job messages and/or are to be omitted on the basis of a preset rule.

In one aspect of the invention, the job message is resent by the terminal device, the wait time for the arrival of the associated performance message starts to run again.

In another aspect of the invention, the terminal device, the wait time is determined individually according to a preset rule as a function of the type of job message.

In still another method of the invention, the sending of additional job messages is delayed upon exhaustion of a send window which describes a preset maximum number of job messages not answered by a performance message.

In yet another method of the invention, the send window comprises two job messages.

In another method of the invention, additional job messages whose sending is delayed owing to the exhaustion of the send window are buffered in a queue.

In yet another method of the invention, at the control unit an acknowledgement message by the control unit to the terminal device is omitted in the event of an interruption of the performed actions owing to an error.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be explained in more detail referring to the Figures in which:

Fig. 1 shows signaling procedures between a terminal unit and a central control unit of the EWSX system, which proceed in the trouble-free case according to the prior art.

Fig. 2 shows a signaling procedure according to the present invention.

DETAILED DISCLOSURE OF THE PREFERRED EMBODIMENTS

Paragraph beginning on line 17 of page 2 has been amended as follows:

~~The problem addressed by the~~ The invention ~~is therefore~~ seeks to modify the performance of the message exchange and its processing in such a manner that requested jobs and actions are completely executed, it no longer being necessary to cancel activities already conducted in the event of a termination of the job, e.g., in the event of an error.

Paragraph beginning on line 17 of page 2 has been amended as follows:

~~Starting from a method for controlling a switching system of the initially described type, this problem is solved according to the~~ In the invention ~~in that~~, at the terminal device(s), any open job message for which the associated performance message has not yet arrived after expiration of a specified wait time from the time of its sending is resent to the control unit and, at the control unit, switching control actions based on an arrived job message are skipped if they were already processed by means of earlier job messages and/or are to be omitted on the basis of a preset rule.

Paragraph beginning on line 30 of page 2 has been amended as follows:

~~The posed problem is solved in a simple manner by this solution, and a~~ A ~~clear~~ reduction ~~of effort~~ in processing at the central control unit can be achieved. At the terminal device, an examination as to whether messages are void owing to subsequent job messages can be eliminated, whereby ~~the effort to realize the~~ control of the terminal devices is simplified.

Paragraph beginning on line 9 of page 3 has been amended as follows:

In ~~a variant~~ another embodiment, at the terminal device the wait time is determined individually according to a preset rule as a function of the type of job message. In a time-saving manner, the repetition cycle of the job message can thereby be adjusted to the expected effort at the central control unit.

Paragraph beginning on line 9 of page 3 has been amended as follows:

~~It is additionally favorable if~~ Additionally, it is preferable at the terminal device that the sending of additional job messages is delayed upon exhaustion of a send window which describes a preset maximum number of job messages not answered by a performance message. However, the repeated sending of the open job messages can continue to proceed. In this manner, an overflowing of the control unit with open jobs is avoided.

Paragraph beginning on line 31 of page 3 has been amended as follows:

~~The invention will be explained in more detail hereinbelow by means of a nonrestrictive exemplary embodiment which relates to the protection switching of multiplexed sections ("multiplex section protection switching") in an EWSX system, referring to the appended Figures in which:~~

~~Fig. 1 shows signaling procedures between a terminal unit and a central control unit of the EWSX system, which proceed in the trouble-free case according to the prior art, and~~

~~Fig. 2 shows a signaling procedure according to the invention.~~

Paragraph beginning on line 10 of page 4 has been amended as follows:

In the case of multiplex section protection switching, additional intrinsically redundant elements ("protecting" elements) are provided and kept in a standby mode for the hardware elements and data objects ("protected elements) used in a communication service. In the event of a disturbance of the "protected" elements, the "protecting" elements can take over the task of the failed elements and thus maintain a substantially trouble-free operation. More-detailed

information about protection switching follows from Recommendation ITU-T G.774.03 of the International Telecommunications Union (ITU). As regards the protection switching, a message exchange is initiated between a terminal device and the central control unit. Here the message exchange is begun in principle by the terminal device, since the terminal device is responsible for detecting changes on the line, performs a protection switching if necessary --e.g., in case of a disturbance--, and then exchanges messages about those measures with the central control unit. At the control unit, corresponding actions relating to the control and management of the switching system are executed on the basis of those messages, e.g., an updating of the protection status, a change or updating of the affected data objects, the informing of other programs of the control unit about any changes relating to the availability of the affected service, and, ~~especially,~~ the sending of message acknowledgements to the terminal device.

Paragraph beginning on line 5 of page 5 has been amended as follows:

~~Suppose, for example, that~~ In the following example, a message mdg is sent to the central control unit MP from the terminal device AE, ~~there is sent to the central control unit MP a message mdg~~ which relates to a change of the protection status of the multiplexed section, namely, for example, a switchover between protected and protecting sections owing to a loss of service. At the control unit MP, the protection statuses of the associated data objects are ~~now~~ changed through the actions ak1 and ak2 and, if necessary, the associated data structures are reconfigured. After waiting for a time interval t1, the control unit performs action akn in which it sends out a notice message (not shown in Fig. 1) to other processes of the EWSX system in order to notify the other applications about the non-availability of the associated service. After that has been performed successfully, the corresponding acknowledgement dfn is issued.

Paragraph beginning on line 17 of page 5 has been amended as follows:

No form of examination is made at the terminal device as to whether ~~or not~~ certain messages are still meaningful. According to the invention, ~~all~~ open messages, i.e., ~~all~~ messages for which no acknowledgement was sent yet, are each sent to the control unit after expiration of its wait period and, in a preferred embodiment ~~favorable manner~~, is repeated until the corresponding acknowledgement has arrived. At the control unit, the requested actions are performed in a known manner on the basis of a message that arrived from the terminal device, until the processing is completed or an error occurs. In the event of any irregularity, the processing is terminated; the central control unit then waits for the next message from the terminal device. In this manner, error-correction measures at the control unit can be dispensed with.

Paragraph beginning on line 28 of page 5 has been amended as follows:

If, for example~~,~~ as is shown in Fig. 2, an error occurs in action ak2 ~~—the reason for the error being irrelevant for the invention at this point—~~, then the control unit MP terminates further processing and no further activities (relating to that message from the terminal device) occur; the acknowledgement to the terminal device is omitted. After a set time tw, the message mdg is repeated by the terminal device AE. The action ak1 was already performed; action ak2 is restarted. If ~~now the other steps~~ t1,akn proceed successfully, an acknowledgement dfn is made to the terminal device.

Paragraph beginning on line 4 of page 6 has been amended as follows:

The ~~maximum allowed~~ number of messages that are sent out from the terminal device and not yet acknowledged by the control unit is advantageously restricted to a "send window". However, before the sending of another message that extends beyond the ~~allowed~~ a predetermined number, one of the messages being processed must be acknowledged. The terminal device repeats the still unanswered messages --in the preferred embodiment without any time limitation-- until they are acknowledged. Messages from the terminal device extending

beyond the send window are suitably placed in a queue of the terminal device. When an acknowledgement arrives for an open message, that message is removed from the send window; the next message is taken from the queue, sent to the control unit and included in the send window until the arrival of its acknowledgement. In this manner, no messages can be lost.

Paragraph beginning on line 23 of page 6 has been amended as follows:

Since the messages from the terminal device can lead to, among other things, both the activation and deactivation of the associated service, and since~~, moreover,~~ a time evaluation of those messages occurs at the control unit, the send window is favorably established as being two messages. Hence at least up to two messages from the terminal device can be undergoing processing at the control unit. ~~It is thereby guaranteed that, for example~~ Hence, at the control unit during the course of a time interval whose course was started, e.g., to await the arrival of a release message by means of a message from the terminal device and which is not acknowledged until completion or termination, the release message can be sent from the terminal device and leads correctly to an termination of the time interval.

Paragraph beginning on line 7 of page 7 has been amended as follows:

This is illustrated by way of example in Fig. 1a. As in Fig. 1, a message mdg relating to a switchover between protected and protecting sections is sent from the terminal device AE, and the corresponding actions ak1 and ak2 are initiated at the control unit MP. However, service is restored at the terminal device AE during the time interval t1. Accordingly, a second message wdm occurs, which revokes the loss of service. Namely, the time interval is set so as to allow a possible revocation. At the central control unit MP, both the first message ~~dfn~~ mdg and also its revocation wdm are now each acknowledged with an acknowledgement dfn, df2, respectively. However, if the processing was interrupted as in Fig. 2, both acknowledgements dfn, df2 are omitted. In this case, both messages mdg and wdm are repeated by the terminal unit until the corresponding jobs are correctly executed and acknowledged.

Paragraph beginning on line 14 of page 7 has been amended as follows:

In some circumstances, the processing of a message ~~can~~ may take ~~quite~~ a long time -- up to several seconds or, in special cases, about a minute. During that time, various error branches can be run through at the control unit, e.g., on the basis of a deficiency of resources, missing or incorrect acknowledgements, etc. The actions that are executed until the termination owing to an error branch are not canceled. Since also no acknowledgement is sent from the control unit, the original message from the terminal device is repeated. At the control unit, already executed actions are skipped or updated; the actions still outstanding are now performed. Which of the actions have already been processed and thus can be omitted is determined by means of a predefined rule. That rule can depend on the particular application and can make allowance for various attributes such as, for example, the protection status (protecting or protected), the operating status (free or blocked) or a processing time. Not until ~~all~~ the actions have been ~~completely~~ processed does the control unit send the corresponding acknowledgement to the terminal device.

Paragraph beginning on line 1 of page 8 has been amended as follows:

No evaluation is made at the terminal device as to whether, e.g., in the case of a message status, certain messages have become "obsolete" in the meantime and can thus be discarded. Rather, ~~all~~ message events are buffered and each of them is sent to the control unit after expiration of the wait time, if the associated acknowledgement has not yet arrived.

Paragraph beginning on line 7 of page 8 has been amended as follows:

For reasons of simplicity, the value selected for the wait time tw is a uniform value which is dimensioned according to the expected time for error-free execution of the longest job. In a ~~variant~~ another embodiment, the wait time tw can be determined individually at the terminal device in accordance with a preset rule as a function of the type of job message, thereby enabling

the repetition cycle of the job message to be adjusted in a time-saving manner to the expected effort at the central control unit.

On page 9, line 1, please replace "Patent Claims" with --WHAT IS CLAIMED IS--.

In the Claims:

1. (Amended) A ~~Method~~ method for controlling a switching system which has a central control unit ~~(MP)~~ and a number of peripheral terminal devices, ~~wherein~~ comprising:

~~a job message (mdg) is sent~~ sending a job message from one ~~(AE)~~ of the terminal devices to the control unit ~~(MP),~~;

~~switching control actions (ak1, ak2, akn) are performed~~ performing switching control actions by the control unit ~~in dependence upon~~ based on the job message~~,~~; and

~~in case of successful performance of those actions, a corresponding performance message (dfn) is sent~~ sending a corresponding performance message from the control unit to the terminal device when the switching control actions are successfully performed~~.~~, wherein

~~characterized in~~

~~that~~ at the terminal device~~(s) (AE)~~, any open job message ~~(mdg)~~ for which the associated performance message has not yet arrived after expiration of a specified wait time ~~(tw)~~ from the time of ~~its~~ sending is resent to the control unit and,

~~that~~ at the control unit ~~(MP)~~, actions ~~(ak1)~~ of the switching control based on an arrived job message ~~(mdg)~~ are skipped if they were already processed by means of earlier job messages and/or are to be omitted on the basis of a preset rule.

2. (Amended) The ~~Method~~ method according to claim 1, ~~characterized in~~

~~that~~ wherein when the job message is resent by the terminal device, the wait time ~~(tw)~~ for the arrival of the associated performance message starts to run again.

3. (Amended) ~~Method~~ The method according to claim 1 ~~or 2~~, ~~characterized in that~~ wherein at the terminal device, the wait time ~~(tw)~~ is determined individually according to a preset rule as a function of the type of job message.

4. (Amended) ~~Method~~ The method according to ~~any of~~ claims 1 ~~to 3~~, ~~characterized in that~~ wherein at the terminal device the sending of additional job messages is delayed upon exhaustion of a send window which describes a preset maximum number of job messages not answered by a performance message.

5. (Amended) ~~Method~~ The method according to claim 4, ~~characterized in that~~ wherein the send window comprises two job messages.

6. (Amended) ~~Method~~ The method according to claim 4 ~~or 5~~, ~~characterized in that~~ wherein additional job messages whose sending is delayed owing to the exhaustion of the send window are buffered in a queue.

7. (Amended) ~~Method~~ The method according to ~~any of~~ claims 1 ~~to 6~~, ~~characterized in that~~ wherein at the control unit an acknowledgement message ~~(dfn)~~ by the control unit to the terminal device is omitted in the event of an interruption of the performed actions owing to an error.

In the Abstract

Please replace the Abstract in its entirety with the Abstract attached hereto.